Compass Minerals

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

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DIVISION OF AIR QUALITY

SIP

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A Compass Minerals Company

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November 20, 2013

Bryce C. Bird
Director
Division of Air Quality
UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
195 North 1950 West, Fourth Floor
P.O. Box 144820
Salt Lake City, Utah 84116

Re: **Comments on the Proposed $PM_{2.5}$ State Implementation Plan ("SIP")**

Dear Mr. Bird:

Great Salt Lake Minerals Corporation ("GSLM") respectfully submits the following comments on proposed R307-110-17 and $PM_{2.5}$ SIP Subsections IX.H.11, 12, and 13. Specifically, this letter is in response to the public notices in the September 1 and October 1, 2013 Utah State Bulletins (DAR Files 37903 and 37988, respectively) regarding the proposed $PM_{2.5}$SIP and provides comments on the sections relating to and impacting GSLM's operations in Weber and Box Elder counties. According to the notices and DAQ's web page, the second comment period on these proposed rules (i.e. R307-110-17, SIP Subsections IX.H.11, 12, and 13, and RACT Summary Table) runs from November 1, 2013 to December 2, 2013. *See* http://www.airquality.utah.gov/Public-Interest/Public-Commen-Hearings/Pubrule.htm .

GSLM, and its predecessors, have been operating on the Great Salt Lake ("GSL") since the 1960s. GSLM extracts mineralized water from the GSL and uses a combination of solar evaporation, precipitation, separation, screening, washing, and other techniques to produce three (3) primary products: (i) sodium chloride (i.e. salt), (ii) sulfate of potash ("SOP"), and (iii) magnesium chloride. GSLM currently employs approximately 350 people at its operation west of Ogden, Utah.

This SIP rulemaking is being undertaken by DAQ in at least two separate components. This set of comments focuses primarily on SIP Subsection IX.H.12.h which proposes to impose stringent and new PM and NO_x emission limitations on GSLM's Ogden facility. A discussion of the proposed Subpart H SIP requirements specific to GSLM necessarily includes a discussion of some of the relevant and more general requirements and support information that form the basis for the emission limits and pollution controls imposed by Subpart H. GSLM hereby reserves the right to provide further comment on this and other installments of the SIP rulemaking as such installments become available. This includes the completion of modeling and the Technical Support Document ("TSD").

Comments:

1. Incorporation by Reference. DAQ received a number of written comments during the first public comment period on the $PM_{2.5}$SIP that closed on October 31, 2013. GSLM agrees and concurs with a number of the points raised in these comment letters. Specifically, GSLM hereby incorporates by this reference the comments previously submitted to DAQ by Environmental Resources Management ("ERM") for the Utah Manufacturers Association, Utah Mining Association, and Utah Petroleum Association and dated October 31, 2013 (hereinafter "UMA Comments."). A copy of the UMA Comments is enclosed herewith as Attachment "**A.**"

2. Apply RACT not BACT to GSLM. In Subsection IX.H.12.h of the proposed SIP, DAQ proposes to impose an identical PM emission limit on a total of thirteen (13) emission points at GSLM. The proposed emission limit is 0.010 grains/dscf.[1] If feasible and cost-effective, these stringent limits could only be attained through the installation of state-of-the-art secondary or "polishing" fabric filter (i.e. baghouse) systems on the identified emission points in addition to the existing primary baghouses already installed on the emission units. DAQ presents these limits in the proposed SIP as Reasonably Available Control Technology for retrofitting at GSLM. However, as explained below, these requirements do not constitute reasonably available control technology ("RACT") because the cost is too high and inappropriately elevates the PM requirements from RACT to the more stringent best available control technology ("BACT").

The applicable federal regulations under 40 CFR §51.1010 prescribe the Requirements for RACT and Reasonably Available Control Measures ("RACM") applicable for each $PM_{2.5}$nonattainment area. These regulations require that the State submit with the attainment demonstration a SIP revision demonstrating that it has adopted all RACM (including RACT for stationary sources) necessary to demonstrate attainment as expeditiously as practicable and to meet any reasonable forward progress ("RFP") requirements. GSLM believes the DAQ has stretched the regulatory requirement for RACT beyond its regulatory definition and is demanding more stringent controls that represent BACT emission limits for application to GSLM operations. BACT-equivalent emission controls are reserved only for New Source Review ("NSR") permitting not SIP limits. *See, e.g.*, 40 C.F.R. § 52.21.

RACT is defined by EPA as, "*the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.*" *See* 44 Fed. Reg. 53762, September 17, 1979 (emphasis added). By contrast, the EPA definition for BACT is, "*an emissions limitation ... based on the maximum degree of reduction for each pollutant subject to regulation under the*

[1] In addition, DAQ proposes to require an even more stringent PM limit (i.e. 0.0053 grains/dscf) for the Bulk Truck Salt Loadout.

Act which ... on a case by case basis, taking into account energy, environmental, and economic impacts and other costs, determines is *achievable for such source."* 40 C.F.R. § 52.21(b)(12) (emphasis added). For both BACT and RACT, the economic and technological feasibility of the controls is to be considered.

GSLM engaged CH2M Hill to take a close look at the feasibility of the PM controls proposed by DAQ in Subsection IX.H.12.h of the $PM_{2.5}$ SIP. CH2M Hill prepared a report entitled, "RACT Determinations for the Great Salt Lake Minerals" ("CH2M Hill Report"), enclosed herewith as Attachment "**B.**" In brief, CH2M Hill found that the PM controls prescribed in the SIP for the GSLM point sources result in expected costs ranging from approximately $16,000 to $650,000 per ton of PM reduction (CH2M Hill Report at pp. 3 to 6). These high-end costs for pollution controls exceed prior pollution control requirements implemented by the DAQ under either RACT or BACT, and will have significant impacts on the economic viability and potential for future growth of GSLM within the $PM_{2.5}$ nonattainment area. In its RACT Evaluation Report for GSLM (October 1, 2013), DAQ concedes that costs in this range are "economically infeasible." DAQ RACT Report at pp. 8-9 (upon review of SCR as a control strategy for GSLM boilers, DAQ determined that $232,616 per ton of NO_x reduced rendered the control strategy "infeasible"). Thus, GSLM submits that the controls are legally inappropriate.

In addition to the PM controls, in Subsection IX.H.12.h, DAQ also proposes a requirement that "all dryers" be retrofitted with "ultra-low NO_x burner technology." *See* SIP Subsection IX.H.12.h.vi. As with the PM controls, the CH2M Hill Report concludes that the costs for these stringent NO_x controls would range from approximately $23,000 to $88,000 per ton of NO_x removed. The cost for these controls by far exceed what DAQ has historically accepted for RACT or BACT controls. Accordingly, imposition of these controls on GSLM is unreasonable and legally inappropriate.

As far as technological feasibility is concerned, GSLM believes that the installation of "ultra-low NO_x burners" on the dryers is impossible without replacing the entire dryer. Given the physical geometry of the rotary dryers with combustion occurring at one end of a refractory lined tube, low and ultra-low NO_x burners are not feasible for rotary dryers such as those in use at GSLM because management of secondary combustion air, as a key aspect of low- NO_x burners, cannot be accomplished with separate ports and adjustments for secondary combustion air. Rather, combustion in a rotary dryer is accomplished by managing primary air for good combustion and managing the excess air and formation of NO_x to maintain the fuel and energy efficiency of the dryer. These circumstances are different, for example, from those of a boiler or cement kiln whereby the mixing of fuel and combustion air can be manipulated and staged to minimize the conditions favorable to formation of NO_x. GSLM's position is that RACT for its NO_x emissions from the dryers should be combustion management, emphasizing reduction of the peak flame zone temperature. This type of RACT control is both technologically and economically feasible for GSLM's operation.

3. Appropriate Stack Test Methods. Subsection IX.H.12.h.iii of the proposed SIP provides that compliance with the GSLM "emission limits shall be determined by stack test as

outlined in Section IX Part H.11.e of this SIP." Part H.11.e requires the use of EPA stack test methods 201, 201A, and 202 with an opportunity for approval of other stack test methods by the Director. It is widely recognized that Methods 201 and 202 yield results for particulates that are significantly higher than reality, especially due to artifact formation when determining condensable PM. Instead of requiring methods that will result in extraordinarily high particulate matter results, and leaving only an option to use "other EPA-approved testing methods acceptable to the Director," the State should include more appropriate methods such as U.S. EPA CTM-039, which is a dilution sampling method. In addition, there are modifications to CTM-039 that increase sensitivity and make it even more accurate for measuring particulates from natural gas-fired equipment, which typically has lower PM emissions than the sources that Methods 201 and 202 are suited for. It would be best if the State specified this method and its modifications to prevent the development and submission of erroneous data. For further information on this issue, please refer to the comments submitted to DAQ on October 31, 2013 by Environmental Resources Management ("ERM") on behalf of the Utah Manufacturer's Association, Utah Mining Association, and Utah Petroleum Association. *See* Attachment A, p. 3-4.

4. Emission Limits Should apply to $PM_{2.5}$ Emissions, Not PM_{10} Emissions. The emission limits imposed on GSLM and listed in section IX.H.12.h.i of the proposed SIP are expressed as PM_{10} limits rather than $PM_{2.5}$emission limits. This is problematic for several reasons. First, as discussed above, under sections IX.H.12.h.iii and IX.H.11.e of the proposed SIP, compliance with the new SIP emission limits shall be determined using EPA stack test methods 201 and 202 which includes condensable PM for compliance purposes. However, under the existing PM_{10} SIP, condensable PM is measured only for inventory not compliance purposes. *See* PM_{10} SIP, section 2.1.A (1991) ("The back half condensables are required [only] for inventory purposes...The PM-10 captured in the front half [i.e. filterable PM]...shall be considered for compliance purposes."). Thus, GSLM is being subjected to a more stringent limit for PM_{10} than what the PM_{10} SIP requires. Indeed, a review of the proposed SIP emission limits for all sources reveals that (with the sole exception of a single PM limit for Procter & Gamble) all PM limits for all other SIP sources in the Salt Lake City nonattainment area are expressed as $PM_{2.5}$ not PM_{10}. GSLM is therefore being singled out and required to comply in a significantly different way than the other sources affected by the proposed SIP. The state has not provided notice that its current effort on the $PM_{2.5}$ SIP would have any bearing on the legally binding PM_{10} SIP provisions. Lacking such notice, the proposal for GSLM's PM limits is improper.

Second, because GSLM's limits are expressed as grains per dry standard cubic feet, a PM_{10} limit would be arbitrarily more stringent than the same limit expressed as a $PM_{2.5}$ limit.

To rectify these problems, DAQ should do one of the following: (i) switch the PM_{10} limits to $PM_{2.5}$ limits; (ii) provide GSLM with adequate time to develop a defensible method for converting the PM_{10} limits to $PM_{2.5}$ limits; or (iii) eliminate the requirement in section IX.H.11.e for use of condensable PM for compliance purposes with respect to GSLM's PM_{10} limits.

5. DAQ Lacks Justification to Impose a Blanket Requirement for Ultra-Low NO_x Burners. In section IX.H.12.h.vi of the proposed SIP, DAQ imposes a blanket requirement on

GSLM for across-the-board installation of "ultra-low NOx burner technology" on "all dryers." No emission limits have been calculated or stated in the proposed SIP in connection with this requirement. Rather, a regulatory mandate is imposed to install a very particular type of technology on certain emission points. DAQ's justification for this approach appears not to have any basis or support in the administrative record.

As explained above, ultra-low NO_x burners are not technologically feasible for the particular dryers in use at GSLM and will not achieve the emission reductions DAQ has hypothesized. In the DAQ RACT Report for GSLM, DAQ makes the assumption that use of ultra-low NO_x burners in the dryers at GSLM will achieve a 77% reduction in NO_x emissions at six (6) dryers. DAQ RACT Report at p. 4. However, DAQ is relying on data obtained from the use of ultra-low NO_x burner controls on boilers. *See id.* Dryers are not boilers. There is no basis in the record or otherwise to conclude that the ultra-low NO_x burners will function as DAQ has assumed. In addition, a review of the DAQ RACT Report indicates that DAQ did not perform a proper RACT analysis in its attempt to justify the ultra low- NO_x burner controls in the first place. The DAQ concedes that "a determination of whether the [ultra-low NO_x] control option was economically infeasible was not made by DAQ." DAQ RACT Report at p. 4.[2]

Finally, the DAQ RACT Report contains a technical report from TechLaw, Inc. that contradicts DAQ's efforts to require ultra-low NO_x burner controls on the dryers at GSLM. TechLaw notes that all GSLM dryers use clean natural gas as the sole fuel.[3] In addition, TechLaw notes that, according to current emission inventory data, the GSLM dryers have low NOx emissions and in at least one instance (i.e. dryer AH-075) the emission controls were determined to be BACT. TechLaw report at pp. 6-7. Finally, Appendix A-3 of the TechLaw report (RACT Evaluation for NOx), TechLaw concludes that with regard to dryers, "NO_x was not addressed, but emissions are low or zero." TechLaw further states in the notes that RACT for dryers under EPA's RACT/BACT/LAER Clearinghouse can be "natural gas/propane fuel." In light of this record, DAQ's insistence on ultra-low NO_x burners on "all dryers" is contrary to applicable legal requirements for state environmental agencies under the Clean Air Act. *See, e.g., Alaska Dept. of Envl. Conservation v. EPA*, 124 S.Ct. 983, 998, 1006-1008 (2004) (where EPA rejected the state agency's BACT determination because the state lacked factual basis in the record for its BACT limits and "failed to provide reasoned justification" for requiring installation of ultra-low-NO_x burners rather than selective catalytic reduction).

6. <u>DAQ Modeling Does Not Necessarily Justify PM Controls on GSLM</u>. Largely at the urging of U.S. EPA, DAQ has created very large $PM_{2.5}$ nonattainment areas along the Wasatch Front that conveniently follow political boundaries (i.e. county lines). GSLM operates

[2] DAQ argues that GSLM did not provide a cost analysis for the ultra-low NOx technology. This assertion is contradicted by the record, which includes a document provided by GSLM to DAQ (and included in the DAQ RACT Report) entitled, "GSLM's Dryer Burner Replacement RACT" dated August 6, 2013. In GSLM's analysis, it concluded that the cost per ton of NOx reduced for ultra low-NOx controls would be $290,000 making such controls economically infeasible. DAQ appears to have ignored this analysis in its report.

[3] TechLaw, Inc., "Revised RACT Evaluation Report Great Salt Lake Minerals Corporation, p. 6 (July 17, 2013) ("TechLaw Report").

in some rural and remote areas of Weber and Box Elder counties that are probably best characterized as a "sub-region" of the large Salt Lake City $PM_{2.5}$ nonattainment area. Given this, there is some question about whether and how GSLM contributes to any $PM_{2.5}$ nonattainment situation in its sub-region or other portions of the larger nonattainment area. GSLM submits that DAQ's modeling has not adequately addressed this critical issue of causation. GSLM wishes to reiterate for the benefit of DAQ the following comment made in the UMA Comment letter: "The SIP provides a summary of the overall effects of the control measures in all areas. However, due to the high variability within the large non-attainment domain, it would be helpful to discuss the effect of each control measure for each sub-region. Providing region-wide reductions, and in particular providing only the overall combination of region-wide reductions, *does not provide sufficient information on the effectiveness of each control measure* to individual sub-regions." *See* Attachment "**A**," p. 9 (emphasis added).

GSLM would be happy to meet with DAQ to discuss any of the points raised in this letter. To arrange a meeting, please feel free to contact me or Rod Smith (technical) at (801) 732-3251 or Steve Christiansen (legal) at 801-532-7840.

Sincerely,

Terry Bleckner, CIH, CSP
Environmental, Health & Safety Manager

Enclosures
cc: Denise Hubbard
Rod Smith

4848-8847-1318

Attachment A

Utah Manufacturers Association Comments

HOLLAND&HART LLP
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October 31, 2013

Mr. Bryce Bird
Director
Utah Division of Air Quality
P.O. Box 144820
Salt Lake City, UT 84116

Re: Proposed $PM_{2.5}$ State Implementation Plan

Dear Mr. Bird:

This letter is submitted on behalf of the Utah Manufacturers Association, the Utah Mining Association, and the Utah Petroleum Association (collectively, the "Associations"). The Associations' members collectively consist of approximately 1,000 companies, including the significant manufacturing, mining, oil and gas production, and petroleum refining operators in the State of Utah.

This letter is in response to the public notices in the September 1 and October 1, 2013 Utah State Bulletins (DAR Files 37903 and 37988, respectively) regarding the proposed $PM_{2.5}$ State Implementation Plan ("SIP"), and provides technical comments organized by Environmental Resources Management (ERM) on behalf of the Associations. The comments provided pertain to SIP Section IX, Part A for which the public comment is currently open through October 31, 2013, as well as SIP Section IX, Part H (Control Measures for Area and Point Sources) for which the official public comment period will run from November 1 to December 1, 2013. Additionally, we expect that certain individual member companies from the Associations will submit specific comments pertaining to the SIP language relating to their operations.

We note that the SIP rulemaking is being undertaken in at least two major components which are being processed on separate tracks, including from a timing perspective. Because of the relationship between the two components it is difficult if not impossible to completely assess the entirety of the SIP rulemaking in such piecemeal fashion. We also understand that both the modeling and other aspects of the SIP are continuing to be revised since being published for public comment. For these reasons, we reserve the right to provide further comment on this first installment of the SIP rulemaking pending the availability of the balance of the SIP rulemaking and pending completion of the modeling and Technical Support Document (TSD).

We have compiled this set of general comments that we hope will facilitate the comment review and response process by the Utah Division of Air Quality (UDAQ).

We recognize and appreciate the pressure under which the UDAQ has completed the $PM_{2.5}$ SIP and Technical Support Documents (TSD). Accordingly, we respectfully submit the attached

HOLLAND&HART LLP

general comments on the proposed $PM_{2.5}$ SIP and associated proposed rules for consideration by the UDAQ. Please contact me at (801) 799-5847 or David Wilson (ERM) at (801) 595-8400 if clarification on any of these comments is needed.

Sincerely,

James A Holtkamp

James A. Holtkamp
Chair, Air Subcommittee
Utah Manufacturers Association

TECHNICAL COMMENTS ON $PM_{2.5}$ STATE IMPLEMENTATION PLAN (SIP)

Prepared on Behalf of:
Utah Manufacturers Association
Utah Mining Association
Utah Petroleum Association

Prepared by:
Environmental Resources Management (ERM)

INTRODUCTION

Environmental Resources Management (ERM) was retained by member companies of the Associations to provide technical review of the Utah Division of Air Quality's (UDAQ) $PM_{2.5}$ modeling process, State Implementation Plan (SIP), and Technical Support Documents (TSD). ERM has prepared this compiled set of technical comments on behalf of the Associations based on our reviews of these documents and input received from members of the named Associations. Our comments are general in nature pertaining to the SIP development process, modeling approach and outcomes, and proposed SIP and TSD documents. We have organized our comments under the two major headings: "General Comments" and "$PM_{2.5}$ Model Comments." Some of these comments are the same as those submitted by the Associations during the October 2012 public comment period, as they remain relevant and have not yet been addressed in our opinion. We expect that specific input from individual member companies will also be submitted to the UDAQ pertaining to specific operations and proposed emission limits and other conditions impacting their facilities.

GENERAL COMMENTS

1. Define the Timeline for Effective Implementation of the SIP

The UDAQ has not presented in the SIP or elsewhere to our knowledge a time table of effective dates for implementation of the SIP. It is unknown whether the SIP requirements are wholly effective on January 1, 2014, or only upon approval by EPA, or if there is a phased implementation of the SIP requirements. Additional clarification around this schedule is requested by the Associations.

2. Define Future Permitting Process Requirements Under $PM_{2.5}$ SIP, Especially with Respect to Offset Requirements

We are concerned that the SIP will significantly affect future permitting and the potential for economic growth within the nonattainment areas. In particular, the SIP does not provide adequate clarity regarding how modifications and off-set requirements will affect the permitting process following implementation of the SIP. The SIP should expressly provide that certain SIP provision will not apply unless and until EPA takes action to approve the SIP. This is necessary to avoid confusing and duplicative regulatory programs that may never become fully effective as a result of EPA action that is beyond the control of the State of Utah. Utah has experienced problems and uncertainty with its efforts to revise the PM_{10} SIP in 2005. Utah adopted a number of provisions that differed from and potentially conflicted with the federally-approved (1994) SIP making sources subject to uncertain requirements.

In the 2005 SIP rulemaking, Utah did take some steps to ensure that certain regulatory requirements would not become effective unless and until EPA approval and we recommend that the UDAQ do likewise now. In the 2005 rulemaking, Utah included a new offset requirement prohibiting the use of interpollutant offsets which is allowed under the current rule. *See* R307-421-4(3) ("Emission offsets shall not be traded between pollutants."). However, the rule, by its terms would only become effective if EPA took action to approve the redesignation request per R307-421-5 (Transition Provision):

> *This rule will become effective in each county on the day that the EPA redesignates the county to attainment for PM10. The PM_{10} nonattainment area offset provisions in R307-403 will continue to apply until the EPA redesignates each county to attainment for PM_{10}.*

Of course, the EPA never approved the 2005 package including the redesignation request and this offset requirement never became effective. However, Utah should implement this contingent approach where possible in this SIP rulemaking effort. This is especially true relative to the offset requirements under major nonattainment NSR. Sources should be able to continue to utilize reductions for offsetting in the same manner as they are currently allowed to do until such time as EPA takes action to approve the $PM_{2.5}$ SIP.

Also, the Associations are aware that neither the Salt Lake nor Provo $PM_{2.5}$ SIPs properly address the issue of "emission offset credits" needed for economic development. Utah's air quality regulations, specifically Utah Administrative Rule R307-403-3, require an analysis of any new major source, or major modification to an existing source, in a non-attainment area. In particular, major new sources and major modified existing sources in non-attainment areas must install pollution control equipment having "the lowest achievable emission rate (LAER) for such source" and must also obtain "emission offsets to the extent provided in R307-403-4, 5 and 6." However, the Associations understand that it may be extremely difficult, if not impossible, for many sources to obtain the required "emission offsets" under the current versions of the SIPs. This action causes grave concern for Utah industries about the $PM_{2.5}$ SIPs potential effects on economic development along the Wasatch Front. The state should modify the proposed $PM_{2.5}$ SIPs to address this problem.

UMA requests that the State of Utah modify the SIPs to address the issue of emission offset credits for new and existing sources. Specific EPA guidance on the subject allows the use of "older," or banked, emission credits (Appendix S of 40 C.F.R. Part 51, IV C.5). This EPA guidance states that "[t]he reviewing authority may allow offsets that exceed the requirements of reasonable progress toward attainment (Condition 3) to be 'banked' (i.e., saved to provide offsets for a source seeking a permit in the future") for use under this ruling." Id. Additionally, the guidance, known as Appendix S, further explains that "[a] reviewing authority may allow these banked offsets to be used under the pre-construction review program required by Part D, as long as these banked emissions are identified and accounted for in the SIP control strategy." Id. (emphasis added).

The Associations request that the State of Utah, pursuant to the discretion and authority allowed by federal law and guidance on the subject, "identify and account for" sufficient $PM_{2.5}$ emission offset credits for economic development along the Wasatch Front. We believe that accounting for currently recognized emission reduction credits (or some portion of those credits) could be done without adversely affecting the attainment demonstration. If no such action is taken, it is possible that economic development along the Wasatch Front may not only be harmed, but could be unintentionally halted.

3. Apply RACT (not BACT) per Applicable Regulations

The applicable federal regulations under 40 CFR §51.1010 prescribe the requirements for Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM) applicable for each $PM_{2.5}$ nonattainment area. These regulations require that the state submit with the attainment demonstration a SIP revision demonstrating that it has adopted all reasonably available control measures (including RACT for stationary sources) necessary to demonstrate attainment as expeditiously as practicable and to meet any reasonable forward progress (RFP) requirements. The Associations feel that the state has stretched the regulatory requirement for RACT beyond its regulatory definition and is demanding more stringent Best Available Control Technology (BACT) in many cases.

RACT is defined by EPA as, "*the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is <u>reasonably available</u> considering technological and economic feasibility*" (44 Federal Register 53762, September 17, 1979), underline added. The EPA definition for BACT is, "*an emissions limitation which is based on the <u>maximum</u> degree of control that can be achieved ... consider(ing) energy, environmental, and economic impact*" (<u>www.epa.gov/NSR/psd.html#best</u>), underline added. In both cases, the economic feasibility of the controls is to be considered. However, the controls prescribed in the SIP for point sources and area sources result in expected costs to industry as high as $25,000 and $6,500 per ton of $PM_{2.5}$ reduction, respectively. These high-end costs for pollution controls exceed prior pollution control requirements implemented by the UDAQ under either RACT or BACT, and are expected to have significant impacts on the economic viability and potential for growth of industries within the nonattainment area.

4. Account for Full Burden of SIP and Other New Air Regulations

In addition to the prospective SIP requirements being reviewed by the major sources, the UDAQ has proposed a number of general rules applicable to all emission sources (e.g., minor and major sources) to address $PM_{2.5}$ emissions. These new rules will have a significant impact on industry, including companies that burn solid fuels, conduct solvent cleaning, perform generator testing, manufacture/operate appliance pilot lights, generate fugitive dust, and operate boilers. We recommend that the UDAQ consider the regulatory burden and costs associated with these new rules concurrent with the SIP implementation requirements, as the impacts are holistic and not independent of one another.

5. Apply Good Judgment Relative to Use of Limited Existing $PM_{2.5}$ Data and Collection of Future Data

During $PM_{2.5}$ SIP development, the UDAQ requested "condensables" data from select Associations' members for inclusion in the SIP. There is only limited industry data available to differentiate condensable vs. filterable $PM_{2.5}$. We recommend that the limits of this database be considered prior to using it for developing policies or regulations to be included in the SIP. Additionally, more clarity in the requirements is needed for collecting, utilizing, and regulating the different varieties of $PM_{2.5}$ emissions (i.e., condensables vs. filterables). The Associations agree with the language presented in the SIP pertaining to flexibility in the stack test methods such that the listed methods may be used, or "*other EPA-approved testing methods acceptable to the Director*" (SIP Part H.11.e.i.C and D). In particular, EPA has identified Conditional Test Method 039 (Dilution Method) as having advantages over the standard test methods, particularly for wet stacks and high volume/low concentrations gas streams. EPA encourages sources that encounter these situations to use this (Dilution) method (Federal Register 80118, 80132 December 21, 2010, 40 CFR Part 51, Methods for Measurement of Filterable PM_{10} and $PM_{2.5}$ and Measurement of Condensable PM Emissions From Stationary Sources; Final Rule), recognizing that there are situations "where dilution sampling provides advantages over the standard test methods," and "encourag[ing] sources that encounter these sources to request that the regulatory authority that established the requirement to use this method to approve the use of dilution sampling as an alternative to the test method specified for determining compliance". [1] Based on this EPA technical conclusion and policy the Associations' members encourage the UDAQ to accept monitoring results obtained in accordance with EPA approved (and recommended) test methods or similar dilution based methods tailored to specific circumstances.

6. Define Major Sources by Operation Rather Than Company Name

The proposed SIP identifying major permit sources by name includes numerical limitations for named point sources within the SIP. This approach for naming specific facilities is not consistent with statements made by Mr. Dave McNeill during the Associations' June 20, 2012 meeting with the UDAQ. We also feel the identification of the companies by name in the SIP may result in difficulties for SIP implementation if the affected facilities change ownership or the names of the companies otherwise change. We recommend that the SIP be clarified to differentiate the facility operations from the company names to enable flexibility for the businesses with respect to requirements documented in the SIP regulations.

7. Assure Corrections are Made to SIP and that Emission Inputs in Model are Consistent with the Emission Limitations in Part H

[1] Consistent with its views regarding the advantages of dilution-based sampling, EPA has approved at least two SIPs expressly listing Conditional Test Method 039 as an acceptable test method. Federal Register 18, 19, January 3, 2007, 40 CFR Part 52 Approval and Promulgation of Air Quality Implementation Plans; Maryland; PM-10 Test Methods; Direct Final Rule; Federal Register 70468, 70470 December 5, 2006, 40 CFR Parts 52 and 70 Approval and Promulgation of Implementation Plans and Operating Permits Program; State of Missouri; Direct Final Rule. Other states likewise permit use of Conditional Test Method 039 by regulation. *See, e.g.*, Mont. Admin. R. 10 CSR 10-6.030(5) ("EPA Conditional Test Method 039 . . . may be used to determine the total PM10 and PM2.5 fraction of filterable particulate matter including condensibles.").

Certain Associations' members have observed that the emissions identified by the UDAQ for use in the attainment demonstration were not correctly incorporated into the modeling and SIP that the UDAQ made available as part of this rulemaking. Our members also observed inconsistencies between the TSD and SIP, and in the data presented on select tables in the TSD for some companies (e.g., inconsistencies between TSD Sections 3.b.ii and 5.c.i). We understand that the UDAQ is continuing to make refinements in the modeling inputs. It will be important that the final attainment demonstration and Part H limits are consistent. We have recommended that each member company carefully review Subsections IX.H.11, 12, and 13 of the SIP (and related TSD sections), and provide source-specific comments and corrections for their operations.

8. Explain Inclusion of Proposed VOC Controls for Box Elder and Tooele Counties if They do not Contribute to Exceedances of the NAAQS

During Air Quality Board meetings pertaining to the SIP, there was discussion relating to SIP Section 6, and the results of area source sensitivity analyses for VOCs in Box Elder and Tooele counties. The UDAQ acknowledged that the VOC controls in the Salt Lake SIP are to be applied in these two counties (as well as others in the nonattainment area), even though sensitivity (model) analysis shows that VOC controls in these two counties do not affect the $PM_{2.5}$ measurements at the Hawthorn Station, which is the station showing violations of the NAAQS. We recommend that the SIP include a clarification of VOC control requirements in Box Elder and Tooele counties or that these controls be removed from the SIP for these areas if there is no observed benefit from their implementation.

$PM_{2.5}$ MODEL COMMENTS

The comments below were prepared relative to the UDAQ's $PM_{2.5}$ model, which serves as the basis for development of the SIP. ERM recognizes that the modeling effort performed by the UDAQ required many person-hours over several years, involving input from a large number of sources and many variables; and was therefore a complex process. We provide these comments in light of the enormous effort and hope this input further documents the challenges and complexity of the modeling process.

9. Regional Modeling Impacts

In reviewing the TSD for the draft $PM_{2.5}$ SIP, the initial evaluation of the modeled impacts versus select observed monitoring data indicated that the modeled impacts were underestimating observed concentrations. This outcome could result from a variety of sources, including: inaccurate diffusion parameters, uncertainties in the emissions inventory data, incorrect wind/transport regimes, or overall model limitations. Based upon the TSD, the UDAQ decided to alter the modeling approach by restricting vertical advection in the model calculations to account for inversion conditions. In effect, this artificially limits diffusion in the vertical for the entire modeling domain, thus, increasing model-predicted concentrations in all regions of the non-attainment areas. Because of the large area of the non-attainment region with varied geographic, land-use, and emissions criteria, the use of this simplified scheme (in order to match observed concentrations for a very limited dataset) is likely to overestimate concentrations in many of the sub-regions. At a minimum, the UDAQ should acknowledge this result and the likely potential that some localized elevated modeled concentrations represent an artifact of the modeling process rather than an expected actual condition.

An alternative approach to restricting the model capability would be to reevaluate the model parameters, to better reflect localized observed concentrations (i.e., increasing model performance) and provide more representative localized concentrations in all areas of the modeling domain. This could lead to the potential for application of control measures only to those areas needing controls and reduce the blanket controls over the entire region based upon unreliable increased concentrations throughout the entire region.

For example, decreasing localized influences of temperatures while increasing the localized influences of wind speeds and directions within the wind regimes could provide comparable concentrations at observed monitoring locations as well as providing more representative spatially varied concentrations throughout the region. Similarly, evaluating initial and boundary conditions, such as the inclusion of possible pre-frontal emissions in combination with the above, could refine localized model performance concentrations, while allowing representative model predictions for the remainder of the region. These considerations and approaches are further discussed in the comments below.

10. Meteorological WRF Data – Effects on Modeling

a) Temperature and moisture play an important part on impacts involving interactive chemistry. Temperature is a measure of vertical dispersion, whereas moisture is used in the algorithm for nitrate and sulfate formation. Both temperature and moisture are measured by various stations in defining the region-wide spatial and temporal levels for the modeling domain. Based upon the SIP, it appears that the surface temperature, as well as the vertical temperature profiles, tend to overestimate the overall temperatures. The use of local temperature data (in urban areas) as the primary basis for regional temperature regimes may overestimate the overall valley temperature in the majority of rural dominated areas. In addition, the SIP does not conduct an evaluation of the humidity data with observed monitoring stations to assess the confidence in this modeling parameter. Reevaluating these criteria may provide more spatially representative dispersion characteristics in evaluating modeled concentrations, rather than artificially restricting vertical movement of emissions.

b) The data provided in the SIP suggest that the WRF modeling system tends to under-predict observed local surface wind speeds in the modeling domain. This would tend to over-predict modeled concentrations. The model uses meso-scale winds to define the regional patterns and the winds are then adjusted later by regional and local wind data. The modification to the meso-scale winds may not have the necessary weight in the adjustment scheme and should be further evaluated. Wind speeds with more localized influence would likely produce more representative effects on model concentrations both in magnitude and spatial distribution.

c) The SIP indicates that the night-time wind directions do not correlate well with observed winds at two of the stations, both in the northern and southern regions of the modeling domain, that were evaluated in the meteorological assessment. Again, meso-scale wind directions are first utilized and then adjusted by the regional and local wind data. An evaluation of the impact of the local effects should be reevaluated. Wind flows with more localized influence would likely produce more representative effects on model concentrations (especially at peak locations) and allow for diverse spatial distribution.

d) In the SIP, meteorological evaluation of the predicted data were compared with observed local data from only four of the monitoring stations in the region, Hawthorne, Linden, Logan, and Ogden. Although these stations are located throughout the modeling domain, it would be helpful to provide a more comprehensive evaluation to include analysis of more monitoring stations due to the large size and varied topographic features of the area within the modeling domain.

11. Initial and Boundary Conditions – Effects on Modeling

a. The use of default initial boundary conditions is an improved practice over the use of zero at the boundary regions within a modeling domain when site-specific data are not available. The SIP indicates that the use of EPA-default initial boundary conditions was assumed due to the lack of local measured data. However, the EPA-default data are based upon average overall conditions throughout the United States and may not be as representative of the modeling domain due to the largely rural area within the boundary areas. To better represent the outer extent of the boundary conditions, it may be helpful to review other areas that have rural monitoring data, such as San Joaquin Valley, to assist in defining the initial boundary conditions.

b. The SIP discusses the limitation of locally-generated emissions from pre-episodic events for inclusion in the modeling domain. Although it has been well analyzed that pre-frontal conditions tend to "wash" emissions from the valley on a local basis, it is uncertain when episodic conditions start to develop. As discussed in the SIP, the maximum predicted concentrations (without exclusion of vertical advection) tend to be under predicted relative to maximum observed concentrations. The importance of the pre-episodic emissions warrants reevaluated, and sensitivity analysis may justify whether pre-frontal emissions affect the overall $PM_{2.5}$ concentrations.

c. The SIP briefly discusses the change of the model default surface albedo to reflect snow conditions during the episodic (inversion) events. Since albedo is an important factor in the dispersive predictions within the model and due to the general under-prediction of the concentrations to observations, it may be helpful to provide a sensitivity assessment of the use of various albedo values on the effects of overall model concentration prediction. This may eliminate the vertical advection restriction ultimately used in the model as discussed in other comments.

d. The SIP provided simulation and historical ambient chemical composition data that show nitrate concentrations are the highest percentage of the ambient $PM_{2.5}$ concentrations, and the nitrate compositions match fairly well with modeled simulations. In addition, the percentage nitrate for each of these areas, where ambient data were available, showed relatively consistent percentages between sites. However, in the northern portion (Logan Area), there were no such ambient data to compare with the simulation, and the simulations showed a significantly higher percentage than all other area nitrate percentages. Since this is the major constituent in $PM_{2.5}$ formation, this anomaly could over-estimate ultimate $PM_{2.5}$ impacts. An explanation for the basis of this anomaly and why it occurs at this location should be addressed.

12. Vertical Cells – Effects on Impacts

a. The SIP provides data on the vertical cell schemes used in the modeling with 34 vertical layers identified in the meteorological derivation. This cell structure was collapsed from 34 to 17 cells, with the first 12 cells having consistent depths as the meteorological derivation. It may be helpful to have a discussion in the SIP showing the percent difference in model performance (which is little) for the various schemes that the UDAQ used to ultimately define the specific 17 cells.

b. We have concerns regarding the elimination of vertical advection in the CMAQ model and the lack of discussion in the SIP on how that would affect diffusion of emissions from one vertical cell to the other. We acknowledge that the removal of advection may better represent the strong cold stagnation effects observed in the region, but the absence of a discussion of the effects limitation on vertical layer diffusion may lead to the conclusion that it is an artificial manipulation of the model. In addition, elimination of the vertical advection in order to match observed (inversion) concentrations in effect forces a "lid" on all areas, which results in a uniform increase in modeled concentrations arbitrarily across the entire region.

13. Aircraft Emissions – Effects on Ground Level Concentrations

The TSD does not provide an adequate basis for the overall emissions calculated for aircraft and the spatial extent of these emissions. Due to the low surface inversions during episodic events, the rapid climb of the aircraft and the shallow layers in the lower vertical cell structure means that emissions were only placed in the first vertical cell layer. However the TSD does not show what emissions were included in the inventory. The emissions profile of a major airport includes emissions from ground operations, taxiing, landings, and take-offs. The SIP and/or TSD should include a more thorough discussion of the emission calculations for aircraft and airport operations, including what operations were included and how emissions were placed in the modeling domain.

14. Model Performance

a. The SIP contains an analysis of initial modeled predicted concentrations showing a general under-prediction of concentrations relative to actual observed concentrations at selected monitoring sites. The UDAQ modified the modeling scheme to exclude vertical advection and reassessed the model performance, which showed predicted concentrations relating better to observed concentrations. However, there are other factors that could represent these differences. For example and as discussed in other comments, the over-prediction of surface temperatures and temperatures in the lower vertical layers could cause greater vertical diffusion than observed, which could under predict surface concentrations. This would be similar to a natural, and selective, vertical diffusion restriction within the modeling domain, rather than an overall restriction conducted in the analysis.

b. With application of the vertical advection restriction, the SIP indicates that there is good correlation between predicted and observed concentrations for the modeling domain, citing an overall greater than 0.5 correlation coefficient. It may be useful to provide a basis for this comparison, since in statistical terms a 0.75 correlation typically represents the minimal value in defining representative correlations. A correlation coefficient of 0.5 represents the median between absolutely no correlation and perfect correlation.

c. The SIP indicates that NOx reductions would be a significant factor in reducing the nitrate $PM_{2.5}$ fraction. However, the majority of the control measure reductions are associated with VOC emissions. There is no discussion of the rate of reduction of $PM_{2.5}$ associated with the VOC reductions versus the NOx reductions. In addition, the further reduction of VOCs would lessen $PM_{2.5}$ as much of it is not the dominant component of the NOx/VOC ratio. The SIP should provide a discussion of this relationship, the effects of the changes in this relationship, and the impact on reductions of each relative to overall $PM_{2.5}$ reduction.

15. Growth Patterns

In the SIP, growth patterns are based upon factors that project growth in populated areas. However, rural areas present a different growth pattern. The SIP should contain a discussion of these differences and how the SIP addresses these area-specific variations in the modeling effort.

16. Regional Controls

The SIP provides a summary of the overall effects of the control measures in all areas. However, due to the high variability within the large non-attainment domain, it would be helpful to discuss the effects of each control measure for each sub-region. Providing region-wide reductions, and in particular providing only the overall combination of region-wide reductions, does not provide sufficient information on the effectiveness of each control measure to individual sub-regions. The question is whether an individual control measure is needed throughout the whole non-attainment region or should only be implemented on a sub-regional basis to be effective. This assessment could lead to a better understanding for a more focused and appropriate application of control measures only to those areas most affected.

17. NOx, SOx, Direct $PM_{2.5}$ Correlations – Effects on Control Measures

The SIP does not discuss the varying effects of NOx, SOx, and direct $PM_{2.5}$ emissions on the overall concentrations and the effects of the control measures on these emissions. It would be helpful to have an analysis and discussion for these pollutants, as it is important in defining overall control strategies that are effective and efficient. For example, the South Coast Air Quality Management District has indicated in its 2011 $PM_{2.5}$ Air Quality Management Plan that direct $PM_{2.5}$ reductions are 14 times more effective than NOx reductions. Although this proportion may vary for Utah, it would be prudent to evaluate the relative differences. In addition, an evaluation of the interaction between precursor pollutants will be important to developing effective control strategies. An example is the control measures that could change the NOx/VOC ratio, which in turn will change the production of nitrate formation.

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Attachment B

“CH2M Hill Report”

Final Report

RACT Determinations for the Great Salt Lake Minerals

Prepared for

Great Salt Lake Minerals

Prepared by

CH2MHILL.

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Contents

Tables

Appendix

1.0 Introduction

Great Salt Lake Minerals (GSLM) is submitting Reasonably Available Control Technology (RACT) determinations for dryers and material handling sources at its facility in Ogden, Utah. GSLM is a salt, magnesium chloride and sulfate of potash production facility located on the eastern shore of the south arm of the Great Salt Lake near Ogden in Weber County. The process uses crystallized salts, including halite (sodium chloride) and a mixed salt containing potassium sulfate and magnesium sulfate from solar evaporation ponds. The raw halite is washed, wet-screened, dried, cooled, and converted to schoenite which is then filtered, dried, screened, half granulated/compacted, and shipped as sulfate of potash.

The facility includes six natural gas-fired dryers and storage and load out sources among others. The identification tags for the six dryers are as follows:

- D-001 SOP Dryer (40 million British thermal units per hour [MMBtu/hr])
- D-002 SOP Compaction Dryer (20.0 MMBtu/hr)
- D-003 SOP Dryer (26.0 MMBtu/hr)
- D-004 SOP Compaction Dryer (20.0 MMBtu/hr)
- D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)
- D-501 Salt Dryer (26.5 MMBtu/hr)

The identification tags for the particulate material handling sources are as follows:

- BH-001 SOP Bulk Loadout (24,400 dry standard cubic feet per minute [dscfm])
- BH-002 SOP Silo Storage (20,100 dscfm)
- BH-005 SOP Compaction Building (16,600 dscfm)
- BH-501 Salt Cooler baghouse (19,000 dscfm)
- AH-500 Salt Plant Compaction/Loading wet scrubber (38,200 dscfm)
- AH-502 Salt Plant screening wet scrubber (16,300 dscfm)

The RACT analysis has been developed for the above mentioned emission sources only.

The Clean Air Act (CAA) requires that stationary sources implement RACT to demonstrate attainment as expeditiously as possible and meet any Reasonable Further Progress requirements. The RACT analysis should identify and evaluate reasonable and available control technologies for each relevant pollutant. The technical and economic feasibility of each potential technology are components of the RACT analysis that help to show whether a control technology is reasonable. The RACT analysis presented in this document has been developed in accordance with the guidance established by the Environmental Protection Agency (EPA) in accordance with the CAA.

A RACT analysis has been developed for each of the emission sources mentioned above. For each emission source, the RACT analysis followed a four step process:

- Step 1—Identify All Control Technologies Listed in the RACT/BACT/LAER Clearinghouse (RBLC).
- Step 2—Eliminate Technically Infeasible Options.
- Step 3—Eliminate Economically/Chronologically Infeasible Options.
- Step 4—Identify RACT.

EPA has vested Utah Division of Air Quality (UDAQ) with discretion in determining whether certain controls are, in fact, reasonable for a source to implement. Furthermore, EPA has advised states to give sources credit for controls that have already been implemented at a significant cost to the source. "[I]f the State or Federal rules already heavily regulate a given sector, it is reasonable for the State to first look to unregulated parts of the sector for RACT/Reasonably Available Control Measures (RACM), especially in light of costs already realized by the regulated sector. A state may conclude that it is unreasonable to further regulate the industry, or that it is only reasonable to impose measures in the latter years of the attainment plan." 72 Federal Register. 20586, 20613/2 (April 25, 2007).

2.0 Source Descriptions and Emissions Information

Particulate emissions, both particulate matter 10 micrometers in aerodynamic diameter and small (PM_{10}) and particulate matter 2.5 micrometers in aerodynamic diameter and small ($PM_{2.5}$) are generated from material handling sources as well as those generated from natural gas combustion in the dryers. Particulate emissions from these sources are currently controlled with a baghouse or wet scrubber as applicable.

The current permitted particulate emissions from the sources listed in Section 1 are shown in Table 2-1. GSLM does not have $PM_{2.5}$ limitations in its Approval Order. Therefore PM_{10} is used as a surrogate for $PM_{2.5}$ in this RACT analysis.

TABLE 2-1
Emission Source Information

Emission Source	Existing Particulate Emissions Control Device	Current Permitted/Vendor Guarantee Emission Rate
D-001 SOP Dryer (40 MMBtu/hr)	Baghouse BH-014	0.015 gr/dscf
D-002 SOP Compaction Dryer (20.0 MMBtu/hr)	Baghouse BH-008	0.015 gr/dscf
D-003 SOP Dryer (26.0 MMBtu/hr)	Wet Scrubber AH-013 (GSLM has committed to replace this scrubber with a baghouse)	—
D-004 SOP Compaction Dryer (20.0 MMBtu/hr)	Wet Scrubber AH-075	0.015 gr/dscf
D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)	Baghouse BH-006	0.015 gr/dscf
D-501 Salt Dryer (26.5 MMBtu/hr)	Wet Cyclone and wet Scrubber AH-513	0.0114 gr/dscf
SOP Bulk Loadout	Baghouse BH-001	0.01 gr/dscf
SOP Silo Storage	Baghouse BH-002	0.01 gr/dscf
SOP Compaction Building	Baghouse BH-005	0.01 gr/dscf
Cooler baghouse	Baghouse BH-501	0.01 gr/dscf
Plant Compaction/Loading wet scrubber	Wet Scrubber AH-500	0.020 gr/dscf
Plant screening wet scrubber	Wet Scrubber AH-502	0.040 gr/dscf

Note:
gr/dscf: grains per dry standard cubic foot

The RACT analysis for these emission sources is presented in Section 3.

Emissions of Oxides of Nitrogen (NO_X) are generated as a by-product of natural gas combustion in the dryers. These dryers are not equipped with add-on controls for NO_X. The RACT analysis for the dryers is presented in Section 3.

In August 2013, the UDAQ made a determination that good combustion practices and use of pipeline quality natural gas is RACT for $PM_{2.5}$, sulfur dioxide (SO_2) and carbon monoxide (CO) emissions generated from natural gas combustion. GSLM agrees with this determination and therefore the RACT analysis for the dryers presented in this document will only focus on control of NO_X emissions.

3.0 RACT Determinations

This section provides RACT determinations for the dryers and material handling sources.

- BH-001 SOP Bulk Loadout (24,400 dscfm)
- BH-002 SOP Silo Storage (20,100 dscfm)
- BH-005 SOP Compaction Building (16,600 dscfm)
- BH-501 Salt Cooler baghouse (19,000 dscfm)
- AH-500 Salt Plant Compaction/Loading wet scrubber (38,200 dscfm)
- AH-502 Salt Plant screening wet scrubber (16,300 dscfm)

3.1 Material Handling Sources

3.1.1 Particulate Emissions from Bulk Loadout, Silo Storage, Compaction Building, and Cooler Building

3.1.1.1. PM_{10} RACT

Step 1—Identify All Control Technologies listed in RBLC. The RBLC identifies the following as possible control technologies for particulate emissions emitted through a mechanical vent

- Baghouses
- Cyclones
- Electrostatic precipitators (ESPs)
- Wet scrubbers

Step 2—Eliminate Technically Infeasible Options. All control technologies are technically feasible. The fabric filter (baghouse) is more effective at capturing fine particulate than an ESP because ESPs tend to collect larger particles selectively. Cyclones are only effective in capturing larger particulate. Wet scrubbers, although effective at capturing fine particulate, produce a water discharge that requires permitting under the National Pollution Discharge Elimination System. Also, wet scrubbers have lower removal efficiencies than fabric filters. Based on their control effectiveness, the fabric filter ranks at the top, followed by an ESP and then by wet scrubbers.

Step 3—Eliminate Economically/Chronologically Infeasible Options. Particulate emissions from the above mentioned material handling sources are already controlled with a baghouse. The vendor guarantee for these baghouses is 0.01 gr/dscf, thus within rounding error for a maximum outlet emission rate of 0.0149 gr/dscf. UDAQ is proposing to lower the PM_{10} permit limit for this baghouse to 0.010 gr/dscf, which effectively establishes a maximum allowable outlet rate of 0.0104 considering rounding. Therefore, there is an inherent 0.0045 gr/dscf difference between an emission rate of 0.010 gr/dscf and 0.01 gr/dscf, which results in a nearly a 50 percent lower permit limit than the effective vendor guarantee. Establishing a permit limit approximately 50 percent more stringent than an equipment vendor's guarantee presents a significant risk to GSLM of not consistently meeting the proposed regulatory limit.

All of the Material Handling Sources currently operate with a baghouse installed for particulate control. Because the baghouse vendor guarantee does not meet the proposed permit limit of 0.010 gr/dscf considering rounding, GSLM will not be able to consistently meet this limit with a single baghouse. Therefore, a primary baghouse and a secondary or polishing baghouse will be required in order to achieve compliance.

While the operating costs will continue to be the same for the existing baghouse, additional capital costs and operating costs will be incurred by GSLM for the new polishing baghouse. The economic analysis for the new baghouses is presented below, and assumes that the existing baghouse will continue operation, and a new baghouse will be installed as a polishing unit in order to achieve consistent compliance with the proposed permit limit.

TABLE 3-1
Economic Analysis for Particulate Removed with Baghouses for Material Handling Sources

Source Name	Tons of PM_{10} Emissions Reduced (tons per year (tpy))	Annualized Costs[1]	Cost per ton
Bulk Loadout Baghouse	4.49	$ 238,758	$ 53,192
Silo Storage Baghouse	3.70	$ 238,758	$ 64,571
Compaction Building	3.05	$ 238,758	$ 78,186
Salt Cooler Baghouse	3.50	$ 238,758	$ 68,310

[1] – Baghouse costs are taken from previous GSLM RACT cost analysis, with estimated baghouse capital cost of $1,101,000 (estimated annual cost of $156,758), and total annual operating cost of $82,000.

Installing a new baghouse and polishing baghouse to meet the UDAQ proposed emission limit of 0.010 gr/dscf for PM_{10} is not economically feasible. Please refer to Appendix A for additional cost information. In addition, after regulatory review, the proposed UDAQ PM_{10} emission limit of 0.010 gr/dscf is found to be not consistent with other agency established regulations. The South Coast Air Quality Management District (http://www.aqmd.gov/rules/download.html) Rule 1155 establishes particulate matter emission limits for various control devices. Since, this rule establishes a particulate emissions limit at 0.01 gr/dscf, therefore the UDAQ proposed PM_{10} emissions limit of 0.010 gr/dscf is more stringent than what is required at the South Coast Air Quality Management District.

While GSLM understands that a lower emission rate has been achieved in practice during recent stack testing, its reproducibility is uncertain. Due to variance in testing data and operations data, it may be difficult to meet a lower limit with the existing baghouse on a consistent basis. A permit and SIP limit should allow for contingency to ensure that the limits can be complied with at all times.

Step 4—Identify RACT. Baghouses are the most effective control technology for controlling particulate emissions. Any permit limit should be established at a level which is RACT, but also allows the unit to achieve consistent compliance. Therefore, a PM_{10} limit of 0.01 gr/dscf is proposed as RACT.

3.1.2 Salt Plant Compaction/Loading and Salt Plant Screening

3.1.2.1 PM_{10} RACT

Step 1—Identify All Control Technologies listed in RBLC. The RBLC identifies the following as possible control technologies for particulate emissions emitted through a mechanical vent

- Baghouses
- Cyclones
- Electrostatic precipitators
- Wet scrubbers

Step 2—Eliminate Technically Infeasible Options. All control technologies are technically feasible. The fabric filter (baghouse) is more effective at capturing fine particulate than an ESP because ESPs tend to collect larger particles selectively. Cyclones are only effective in capturing larger particulate. Wet scrubbers, although effective at capturing fine particulate, produce a water discharge that requires permitting under the National Pollution Discharge Elimination System. Also, wet scrubbers lower removal efficiencies than fabric filters. Based on their control effectiveness, the fabric filter ranks at the top, followed by an ESP and then by wet scrubbers.

Step 3—Eliminate Economically/Chronologically Infeasible Options. The Salt Compaction/Loading and Salt Plant Screening units currently operate with wet scrubbers for particulate control, with current PM_{10} emissions limits of 0.020 and 0.040 gr/dscf respectively. Because the baghouse vendor guarantee does not meet the proposed permit limit of 0.010 gr/dscf, GSLM will be required to install additional controls. Therefore, a primary baghouse and a secondary or polishing baghouse will be required in order to achieve compliance. Since these units currently operate with a wet scrubber, the economic evaluation was completed in two steps; the first step calculates the emissions reduction and cost to install a baghouse, and the next step was to add a polishing baghouse. Costs of two baghouse additions were included for the ultimate polishing baghouse addition option.

While the operating costs will continue to be the same for the existing wet scrubber, additional capital costs and operating costs will be incurred by GSLM for the new controls.

TABLE 3-2
Cost per Ton of Particulate Removed with Baghouses for Salt Screening and Compaction Units

Source Name	Tons of PM_{10} Emissions Reduced (tpy)	Annualized Costs[1]	Cost per ton
Salt Compaction/Loading (Wet Scrubber to Baghouse)	7.17	$ 298,758	$ 41,664
Salt Compaction/Loading (Wet Scrubber to Baghouse + Polishing Baghouse)	14.34	$ 597,516	$ 41,664
Salt Plant Screening (Wet Scrubber to Baghouse)	15.30	$ 238,758	$ 15,606
Salt Cooler Baghouse (Wet Scrubber to Baghouse + Polishing Baghouse)	18.36	$ 477,516	$ 26,011

[1] – Baghouse costs are taken from previous GSLM RACT cost analysis, with estimated baghouse capital cost of $1,101,000 (estimated annual cost of $156,758), and total annual operating cost of $82,000.Installing a new baghouse and polishing baghouse to meet the UDAQ proposed emission limit of 0.010 gr/dscf for PM_{10} is not economically feasible. Please refer to Appendix A for additional cost information. In addition, after regulatory review the proposed DAQ PM_{10} emission limit of 0.010 gr/dscf is not consistent with other agency established regulations. The South Coast Air Quality Management District (http://www.aqmd.gov/rules/download.html) Rule 1155 establishes particulate matter emission limits for various control devices. This rule establishes a particulate emissions limit at 0.01 gr/dscf, therefore the UDAQ proposed PM_{10} emissions limit of 0.010 gr/dscf is more stringent than what is required at the South Coast Air Quality Management District.

Step 4—Identify RACT. The addition of a baghouse is not economically effective for controlling particulate emissions. Therefore, current PM_{10} limits are proposed as RACT.

3.2 Dryers

3.2.1 SOP Dryers, SOP Compaction Dryers, and Salt Dryer

3.2.1.1 NO_x RACT

Step 1—Identify All Control Technologies listed in RBLC. The RBLC identifies the following as possible control technologies for NO_x for natural gas-fired dryers

- Selective Catalytic Reduction (SCR)
- Selective non-Catalytic Reduction (SNCR)
- Low NO_x burners
- Good Combustion Practices

Step 2—Eliminate Technically Infeasible Options. SCR is a post-combustion technique that controls both thermal and fuel NO_x emissions by reducing NO_x with a reagent (generally ammonia or urea) in the presence of a catalyst to form water and nitrogen. NO_x conversion is sensitive to exhaust gas temperature, and performance can be limited by contaminants in the exhaust gas that may mask the catalyst (sulfur compounds, particulate matter, heavy metals, and silica).

The temperature range required for SCR is typically between approximately 600 and 900°F, with other catalyst variations being effective in a wider temperature range. If the SCR catalyst bed is not located in the proper temperature zone, either the reaction efficiency will be reduced if the temperature is too low, resulting in increased ammonia slip, or the catalyst may be damaged if the temperature is too high. Therefore, difficulty in locating the appropriate temperature for the catalyst installation, short residence time in the optimal temperature window, and the presence of particulate contaminants (potential for SCR catalyst plugging) in the dryer flow stream renders SCR as not technically feasible for the dryer application.

SNCR involves injection of ammonia or urea with proprietary conditioners into the exhaust gas stream without a catalyst. SNCR control technology requires gas temperatures in the range of 1,600 to 2,000°F and is most commonly used in boilers. The exhaust temperature gradient for the dryers range between approximately 1,500°F (assumed natural gas flame temperature with Low NO_x burner) and 300°F (dryer exhaust), and the temperature gradient occurs over a relatively short dryer flow path. Therefore, the optimal SNCR operating temperature is outside this window with the cooler Low NO_x burner flame.

Low NO_x burners and good combustion practices are remaining technically feasible options.

Step 3—Eliminate Economically/Chronologically Infeasible Options.

Low NO_x Burners utilizes a pre-mix of the air and natural gas fuel mixture in order to create lean combustion in the burner zone which results in a lower flame temperature. Additional air may be added downstream of the primary burner zone to complete fuel combustion. In some dryer and burner configurations, flue gas recirculation may be utilized to recycle flue gas to the burner zone in order to lower flame temperature and O_2 level.

Good Combustion Practices describe the option which does not require any additional installation of NO_x emission controls. This technology involves operating the burner and dryer as it was designed to be operated.

GSLM calculated current NO_x for the SOP Plant Dryer D-003 by utilizing AP-42 factors and the 2012 Emissions Inventory, which resulted in a calculated emission rate of 0.094 lb/MMBtu. For the projected achievable NO_x emission rate GSLM used a Hauck brochure which stated that 20 ppm NO_x was achievable, which correlated to a controlled NO_x emission rate of 0.022 lb/MMBtu. This resulted in an estimated 77 percent NO_x reduction, and this 77 percent reduction was also assumed to be achievable for all six dryer units. UDAQ utilized this projected NO_x reduction potential to recommend retrofitting all of the dryers with ultra Low No_x burners (which includes FGR), even though the Hauck Low NO_x burner used as the basis for the 77 percent reduction, does not require FGR.

From discussions with burner vendors, achieving advertised NO_x emission rates is very dependent upon the proper design and optimal operating conditions. Any deviations from the most favorable conditions will result in higher NO_x emissions from the burner. Therefore, when establishing expectations regarding consistently achieving NO_x reductions from a Low NO_x burner retrofit, consideration must be given to the design, condition, and operation of the dryer equipment. Allowance should also be made for equipment degradation over time. This design and operating variability will potentially result in significant NO_x emissions variability over time, as compared to burner vendor emission expectations and guarantees.

In order to determine an established NO_x emissions expectation for dryer units, a regulatory review was undertaken. The South Coast Air Quality Management District (http://www.aqmd.gov/rules/download.html) Rule 1147 establishes NO_x emission limits for miscellaneous sources, including dryers. For flame temperatures > 1,200°F, the NO_x emission limit is 60 parts per million (ppm) or 0.073 pound (lb)/MMBtu.

When comparing this controlled emission rate with the baseline uncontrolled rate of 0.094 lb/MMBtu explained above, an expected reduction of 22 percent was calculated.

A request for Low NO_x burner estimated cost, performance, and dimensional information was discussed with several burner/dryer vendors. Since limited detailed information regarding the existing burners and dryers is available, and the response schedule was very aggressive, only one vendor provided a preliminary and budgetary cost estimate. The budgetary installed cost for a new Low NO_x burner was estimated at $600,000 per dryer unit.

From the cost and emissions reduction information above, Table 3 below summarizes the cost per ton values for each of the dryer units. A more detailed calculation spreadsheet may be found in Appendix A.

TABLE 3-3
Cost per Ton of NO_x Removed with Dryer Low NO_x Burners

Unit	Tons of NO_x Removed Per Year	Annualized Cost	Cost/Ton
D-001 SOP Dryer (40.0 MMBtu/hr)	3.68	$ 65,880	$ 22,562
D-002 SOP Compaction Dryer (20.0 MMBtu/hr)	1.84	$ 65,880	$ 45,123
D-003 SOP Dryer (26.0 MMBtu/hr)	2.39	$ 65,880	$ 34,710
D-004 SOP Compaction Dryer (20.0 MMBtu/hr)	1.84	$ 65,880	$ 45,123
D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)	0.94	$ 65,880	$ 88,131
D-501 Salt Plant Dryer (26.5 MMBtu/hr)	2.44	$ 65,880	$ 34,055

While Low NOx burners is technically feasible and capable of the highest level of NOx reduction for the GSLM dryer burners, from Table 3 above, the installation of Low NOx burners is not economically feasible.

Step 4—Identify NOx RACT. Good combustion practices and operating the burners per manufactures recommendations are identified as RACT.

3.2.1.2 PM_{10} RACT

Step 1—Identify All Control Technologies listed in RBLC. The RBLC identifies the following as possible control technologies for particulate emissions emitted through a mechanical vent

- Baghouses
- Cyclones
- Electrostatic precipitators
- Wet scrubbers

Step 2—Eliminate Technically Infeasible Options. All control technologies are technically feasible. The fabric filter (baghouse) is more effective at capturing fine particulate than an ESP because ESPs tend to collect larger particles selectively. Cyclones are only effective in capturing larger particulate. Wet scrubbers, although effective at capturing fine particulate, produce a wet sludge requiring disposal. Also, wet scrubbers have higher operating costs and lower removal efficiencies than fabric filters. Based on their control effectiveness, the fabric filter ranks at the top, followed by an ESP and then by wet scrubbers.

Step 3—Eliminate Economically/Chronologically Infeasible Options. All of the dryer units have baghouses currently installed with the exception of SOP Dryers D-003 and D-004. GSLM has committed to install a baghouse on Dryer D-003, and Dryer D-004 has a current PM_{10} permit limit of 0.015 gr/dscf. Because the baghouse vendor guarantee does not meet the proposed permit limit of 0.010 gr/dscf considering rounding, GSLM will not be able to consistently meet this limit with a single baghouse. Therefore, a primary baghouse and a secondary or polishing baghouse will be required in order to achieve compliance.

While the operating costs will continue to be the same for the existing baghouse, additional capital costs and operating costs will be incurred by GSLM for the new polishing baghouse. The economic analysis for the new baghouses is presented below, and assumes that the existing baghouse will continue operation, and a new baghouse will be installed as a polishing unit in order to achieve consistent compliance with the proposed permit limit. Dryer D-003 assumes a polishing baghouse in addition to the committed primary baghouse, and Dryer D-004 assumes installation of primary and polishing baghouses.

TABLE 3-4
Cost per Ton of Particulate Removed with Dryer Baghouses

Unit	Tons of PM_{10} Removed Per Year	Annualized Cost	Cost/Ton
D-001 SOP Dryer (40.0 MMBtu/hr)	1.07	$ 238,758	$ 222,621
D-002 SOP Compaction Dryer (20.0 MMBtu/hr)	3.61	$ 238,758	$ 68,218
D-003 SOP Dryer (26.0 MMBtu/hr)	3.16	$ 238,758	$ 75,458
D-004 SOP Compaction Dryer (20.0 MMBtu/hr)	11.12	$ 477,516	$ 257,735
D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)	0.36	$ 238,758	$ 658,823
D-501 Salt Plant Dryer (26.5 MMBtu/hr)	3.16	$ 477,516	$ 150,916

Installing a new baghouse meeting the UDAQ proposed emission limit of 0.010 gr/dscf for PM_{10} is therefore not economically feasible. Please refer to Appendix A for additional cost information. In addition, after regulatory review, the proposed DAQ PM_{10} emission limit of 0.010 gr/dscf is not consistent with other agency established regulations. The South Coast Air Quality Management District (http://www.aqmd.gov/rules/download.html) Rule 1155 establishes particulate matter emission limits for various control devices. This rule establishes a particulate emissions limit at 0.01 gr/dscf, therefore the UDAQ proposed PM_{10} emissions limit of 0.010 gr/dscf is more stringent than what is required at the South Coast Air Quality Management District.

While GSLM understands that a lower emission rate has been achieved in practice during recent stack testing, its reproducibility is uncertain. Due to variance in testing data and operations data, it may be difficult to meet a lower limit with the existing baghouse on a consistent basis. A permit and SIP limit should allow for contingency to ensure that the limits can be complied with at all times.

Step 4—Identify RACT. Baghouses are the most effective control technology for controlling particulate emissions. Any permit limit should be established at a level which is RACT, but also allows the unit to achieve consistent compliance. Therefore, a PM_{10} limit of 0.01 gr/dscf is proposed as RACT.

APPENDIX A

Reference Documents

Great Salt Lake Minerals

Cost Analysis for Baghouses

Source Name	Existing PM_{10} Emission Factor/Vendor Guarantee (gr/dscf)	Future PM_{10} Emission Factor (gr/dscf)	Hours of Operation (hrs/yr)	Measured Flow Rate (dscf/min)	Tons of PM_{10} Emissions Reduced (tpy)	Baghouse Capital Cost Estimate	Annualized Capital Cost[1]	Annual O&M Cost	Total Annualized Costs	Cost per ton	
Bulk Loadout Baghouse	0.0149	0.010	8760	24400	4.49	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 53,192	Assumes new polishing baghouse
Silo Storage	0.0149	0.010	8760	20100	3.70	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 64,571	Assumes new polishing baghouse
Compaction Building	0.0149	0.010	8760	16600	3.05	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 78,186	Assumes new polishing baghouse
Cooler Baghouse	0.0149	0.010	8760	19000	3.50	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 68,310	Assumes new polishing baghouse
Plant Compaction/Loading wet scrubber (wet scrubber to baghouse with baseline PM10 emissions of 0.02 and target of 0.015 gr/dscf)[2]	0.02	0.015	8760	38200	7.17	$ 1,101,000	$ 156,758	$ 142,000	$ 298,758	$ 41,664	Assumes commited wet scrubber replaced with one baghouse
Plant Compaction/Loading wet scrubber (wet scrubber to baghouse with baseline PM10 emissions of 0.015 gr/dscf and target of 0.010 gr/dscf)[2]	0.015	0.010	8760	38200	7.17	$ 1,101,000	$ 156,758	$ 142,000	$ 298,758	$ 41,664	Assumes new polishing baghouse and includes costs for two baghouses.
Salt Compaction /Loading (wet scrubber to baghouse + polishing baghouse)[2]	0.02	0.010	8760	38200	14.34	$ 1,101,000	$ 156,758	$ 142,000	$ 597,516	$ 41,664	Assumes wet scrubber to baghouse then to polishing baghouse
Plant screening wet scrubber (wet scrubber to baghouse with baseline PM10 emissions of 0.04 gr/dscf and target of 0.015 gr/dscf)	0.04	0.015	8760	16300	15.30	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 15,606	Assumes commited wet scrubber replaced with one baghouse
Plant screening wet scrubber (wet scrubber to baghouse with baseline PM10 emissions of 0.015 gr/dscf and target of 0.010 gr/dscf)	0.015	0.010	8760	16300	3.06	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 78,032	Assumes new polishing baghouse and includes costs for two baghouses.
Salt Cooler Baghouse (wet scrubber to baghouse + polishing baghouse)	0.04	0.010	8760	16300	18.36	$ 1,101,000	$ 156,758	$ 82,000	$ 477,516	$ 26,011	Assumes wet scrubber to baghouse then to polishing baghouse
D-001 SOP Dryer	0.0149	0.010	8760	5830	1.07	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 222,621	Assumes new polishing baghouse
D-002 SOP Compaction Dryer (20.0 MMBtu/hr)	0.0149	0.010	8760	19600	3.61	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 66,218	Assumes new polishing baghouse
D-003 SOP Dryer (26.0 MMBtu/hr)	0.0149	0.010	8760	17200	3.16	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 75,458	Assumes one polishing baghouse in addition to committed baghouse
D-004 SOP Compaction Dryer (20.0 MMBtu/hr)	0.015	0.010	8760	9870	1.85	$ 1,101,000	$ 156,758	$ 82,000	$ 477,516	$ 257,735	Assumes new primary and polishing baghouses
D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)	0.0149	0.010	8760	1970	0.36	$ 1,101,000	$ 156,758	$ 82,000	$ 238,758	$ 658,823	Assumes new polishing baghouse
D-501 Salt Plant Dryer (26.5 MMBtu/hr)	0.0149	0.010	8760	17200	3.16	$ 1,101,000	$ 156,758	$ 82,000	$ 477,516	$ 150,916	Assumes new primary and polishing baghouses

1 -- Annualuaized capital cost calculated for equipment life of 10 years at 7% interest (0.142378)

2 -- Due to larger size of the Plant Compaction/Loading source, an additional $60,000 was added to the annual O&M cost for additional bag replacement.

Great Salt Lake Minerals

Cost Analysis for LoNOx Burners

Source Name	Existing NOx (lb/hr)[1]	Controlled NOx (lb/hr)[2]	Hours of Operation (hrs/yr)	Tons of PM_{10} Emissions Reduced (tpy)	Estimated Capital Cost[3]	Annualized Costs[4]	Cost per ton
D-001 SOP Dryer (40.0 MMBtu/hr)	3.76	2.92	8760	3.68	600000	$ 65,880	$ 22,562
D-002 SOP Compaction Dryer (20.0 MMBtu/hr)	1.88	1.46	8760	1.84	600000	$ 65,880	$ 45,123
D-003 SOP Dryer (26.0 MMBtu/hr)	2.44	1.90	8760	2.39	600000	$ 65,880	$ 34,710
D-004 SOP Compaction Dryer (20.0 MMBtu/hr)	1.88	1.46	8760	1.84	600000	$ 65,880	$ 45,123
D-005 SOP Compaction Fluid Bed Heater (10.24 MMBtu/hr)	0.96	0.75	8760	0.94	600000	$ 65,880	$ 88,131
D-501 Salt Plant Dryer (26.5 MMBtu/hr)	2.49	1.93	8760	2.44	600000	$ 65,880	$ 34,055

1 -- Assumed 0.094 lb/MMBtu (From GSLM Emissions Inventory for Dryer 003)

2 -- Assumed 0.073 lb/MMBtu (From South Coast Air Quality Management District Rule 1147)

3 -- Assumed nominal $600,000 installed cost for burner from preliminary vendor information

4 -- Assumed 15 year life and 7% Interest Rate

(Adopted December 4, 2009)

RULE 1155. PARTICULATE MATTER (PM) CONTROL DEVICES

(a) Purpose

The purpose of this rule is to establish requirements for permitted particulate matter (PM) air pollution control devices, including, but not limited to, baghouses, high efficiency particulate air (HEPA) systems, bin vents, or other dust collectors using high efficiency or other air filters, cyclones, electrostatic precipitators, and wet scrubbers.

(b) Applicability

This rule applies to the operator of permitted PM air pollution control device(s) venting processes that have direct (non-combustion) PM emissions. A summary of key rule elements is provided in Table 1 of this rule.

(c) Definitions

(1) BEST AVAILABLE CONTROL TECHNOLOGY (BACT) is as defined in South Coast Air Quality Management District (SCAQMD) Rule 1302 – Definitions, subdivision (h).

(2) BAGHOUSE means an air pollution control device designed to remove PM from a gas stream using fabric filters in the shape of a tube or an envelope, or other air filters that are built into a frame or cartridge. For the purpose of this rule, baghouses are separated into three tiers based on the following characteristics:

(A) Tier 1: Baghouses for which the filter surface area is less than or equal to 500 square feet;

(B) Tier 2: Baghouses for which the filter surface area is greater than 500 square feet but less than or equal to 7,500 square feet; or

(C) Tier 3: Baghouses for which the filter surface area is greater than 7,500 square feet.

(3) BAG LEAK DETECTION SYSTEM (BLDS) means a system that monitors electrical charge transfer based on triboelectricity or electrostatic induction to continuously monitor bag leakage and similar failures by detecting changes in particle mass loading in the exhaust.

(4) BIN VENT means an air filtration dust collector designed to remove PM from the air that is displaced by materials filling silos and bins.

(5) CONTINUOUS OPACITY MONITORING SYSTEM (COMS) means a system that meets minimum requirements specified under U.S. EPA 40 CFR Part 60, Appendix B, to continuously monitor opacity.

(6) CYCLONE means an air pollution control device designed to remove PM from a gas stream by inertia.

(7) ELECTROSTATIC PRECIPITATOR (ESP) means an air pollution control device designed to remove PM from a gas stream by imparting a high voltage direct current (DC) charge to the particles while simultaneously ionizing the carrier gas, producing an electric corona.

(8) EXISTING PM CONTROL DEVICE means a PM air pollution control device installed or for which an application for a permit has been deemed complete on or before December 4, 2009.

(9) FACILITY means any source or group of sources or other air contaminant-emitting activities which are subject to this rule and are located on one or more contiguous properties within the SCAQMD, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in 40 CFR Section 55.2. Such above-described groups, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.

(10) NEW PM CONTROL DEVICE means a PM air pollution control device for which an application for a permit has been deemed complete after December 4, 2009.

(11) NON-CONTINUOUS PROCESS means an emissions generating activity vented to a PM air pollution control device that operates no more than once per week or for periods of less than one hour, not to cumulatively exceed 4 hours during any single day.

(12) VERIFIED FILTRATION PRODUCT means a filtration product that has been verified under the U.S. EPA Environmental Technology Verification (ETV) program at the time of purchase. Manufacturers whose filtration product verification has expired must demonstrate at the time of purchase that the product is the same as was previously tested and verified under the ETV program.

(13) WET SCRUBBER means an air pollution control device designed to remove PM from a gas stream by using a finely atomized stream of liquid to capture particulate matter pollutants.

(d) General Requirements

(1) Beginning April 1, 2010, the operator of a facility shall not cause or allow any visible emissions (excluding condensed water vapor) from any PM air pollution control device required to have a permit.

(2) No later than January 1, 2011, the operator of any Tier 3 baghouse shall meet an outlet PM concentration of less than or equal to 0.01 grains per dry standard cubic foot (gr/dscf).

(A) Notwithstanding the above, the operator of hot mix asphalt production equipment shall comply with the 0.01 gr/dscf limit no later than January 1, 2013, unless the operator has documentation that demonstrates that new fabric filters have been installed within 12 months prior to December 4, 2009, in which case the hot mix asphalt production equipment shall comply by January 1, 2014 or at the end of the filter useful life, whichever occurs sooner.

(3) No later than April 1, 2010, all permitted PM control devices shall be operated and maintained in accordance with the manufacturer's operation and maintenance manual or other similar written materials supplied by the manufacturer or distributor of a control device to ensure that the control device remains in proper operating condition. If such documents are not available, the operator shall provide and follow written operation and maintenance procedures for the PM control device(s). Such documentation shall be made available to the Executive Officer immediately upon request.

(4) No later than January 1, 2012 or after the end of the useful life of a manual shaker unit, whichever occurs sooner, the operator of an existing manual

shaker baghouse shall upgrade or replace it with, at a minimum, an automated shaker unit.

(5) An operator shall not install a manual shaker baghouse after December 4, 2009.

(6) If the PM emission limit in paragraph (d)(2) is exceeded, the operator shall file a permit application to use verified filtration products, as defined in paragraph (c)(12), or other technologies or methods demonstrated through source test pursuant to paragraph (e)(6) to comply with the requirement in paragraph (d)(2), within three months of discovery by the operator or of notification by the Executive Officer, to replace the existing filter bags or cartridges. The operator shall install the verified filtration products within three months of issuance of the permit.

(7) If the operator discovers the exceedance of the PM limit in paragraph (d)(2) and resolves the problem that led to the exceedance, within 24 hours of discovery, the operator would not be subject to the requirements in paragraph (d)(6).

(8) When a new process is vented to a new baghouse, the operator shall install and maintain a ventilation system that meets a minimum capture velocity requirement specified in the applicable standards of the most current Edition of the U.S. Industrial Ventilation Handbook, American Conference of Governmental Industrial Hygienists, at the time of installation.

(9) The operator shall discharge material collected in a permitted PM control device for disposal or bring the material back to the process through a controlled material transfer system to prevent fugitive emissions during material transfer, including, but not limited to, shrouding or use of dust suppressants to stabilize the material.

(10) Until more stringent requirements of this rule are effective and after, if still applicable, the operator shall operate and maintain all existing PM air pollution control devices according to existing SCAQMD permit conditions.

(11) For any new or modified PM air pollution control device subject to BACT, the operator of such device shall meet the more stringent BACT level established for that device (pursuant to SCAQMD BACT Guidelines) at the time of evaluation of the permit application for the device.

(e) Monitoring Requirements

(1) No later than March 31, 2010, the operator shall have a minimum of one person trained in the reading of visible emissions pursuant to EPA Method 22. Beginning April 1, 2010, the operator of any baghouse or other PM control device shall have the trained person conduct a continuous five-minute visible emissions observation using EPA Method 22 once a week and shall maintain records for each observation and any necessary subsequent action(s) taken to eliminate visible emissions pursuant to subdivision (f). The provisions of this paragraph shall apply to Tier 3 baghouse units up to and until compliance with the provisions of paragraph (e)(3).

(A) If the operator observes any visible emissions exiting at any time, including during a scheduled Method 22 test, the operator shall implement, within 24 hours, all necessary corrective actions to eliminate the visible emissions.

(B) To verify corrective actions were effective, the operator must restart the operations and complete a new Method 22 test to ensure no visible emissions are present. If visible emissions are still present, further corrective actions pursuant to subparagraph (e)(1)(C) must be taken. If no visible emissions are present, normal operations may resume.

(C) If the operator, after taking all corrective actions, subsequently observes visible emissions, the operator shall shut down the PM emitting equipment that vents into the control device, unless the baghouse operation can be adjusted to ensure no visible emissions, until necessary steps are taken to prevent the visible emissions. Baghouse adjustments include, but are not limited to, closing off specific baghouse chambers.

(D) If the activity being observed is consistently a duration of less than five minutes, then the Method 22 observation shall be for the period in which the activity takes place.

(E) An operator shall not be considered in violation of this paragraph and (d)(1), if the operator complies with subparagraphs (e)(1)(A) through (e)(1)(D).

(F) To the extent that multiple Method 22 tests can be conducted simultaneously, the operator may observe multiple sources contemporaneously at a single time as long as all of the sources are located in the field of view of the observer and appropriate records are kept for each observation. If the operator observes a visible emissions problem during the reading, each source shall then be monitored separately.

(2) Notwithstanding the requirements of paragraph (e)(1), any baghouse outfitted completely with verified filtration products shall only be required to conduct visible emission observations once per month, pursuant to paragraph (e)(1), and shall maintain records for each Method 22 observation and any subsequent actions taken to eliminate visible emissions.

(3) The operator of any Tier 3 baghouse shall install, operate, calibrate and maintain a BLDS pursuant to the manufacturer's written recommendations, to monitor baghouse performance and ensure compliance with in paragraphs (d)(1) and (d)(2).

(A) The provisions of this paragraph shall apply to any new Tier 3 baghouse installed and operated as of December 4, 2009. For an existing baghouse, the facility operator shall file a permit application for a BLDS no later than May 1, 2010 and shall install the BLDS within three months of issuance of the permit.

(B) The BLDS system shall meet the following minimum requirements:

(i) The BLDS sensor must provide output of relative PM emissions; and

(ii) The BLDS must have an alarm that will activate automatically when it detects significant increase in relative PM emissions greater than a preset level and the presence of an alarm condition should be clearly apparent to the facility operator.

(C) The operator shall install a BLDS that has been certified by the manufacturer to be capable of alarming automatically before visible emissions can be seen in the exhaust of a baghouse and shall set the BLDS to operate at such level. The baseline output for the system must be established as follows:

(i) Adjust and maintain the range and the averaging period of the device for the specific application per the manufacturer's written specifications and recommendations; and

(ii) Establish and maintain the alarm set points and the alarm delay time per the manufacturer's written specifications and recommendations.

(D) The operator shall perform adequate maintenance and inspections of a BLDS, according to the written specifications and recommendations of the manufacturer, to ensure that the monitor is operating properly at all times and shall maintain the records pursuant to subdivision (f).

(E) If the operator receives an alarm from the BLDS, the operator shall investigate the baghouse and the BLDS, and take all necessary corrective actions to eliminate the cause of the alarm.

(F) The operator shall maintain filters and operate the baghouse such that the BLDS alarm activation is minimized and the cumulative number of hours of alarm activation within any continuous six-month rolling period do not exceed more than five percent of the total operating hours in that period after following the procedures of subparagraph (e)(3)(G), including, but not limted to, shut down of the equipment as specified.

(G) Each time the alarm activates, the operator shall count the alarm time as the actual length of time of the elevated emissions that caused the alarm and record it. If the inspection of the baghouse, pursuant to subparagraph (e)(3)(E), demonstrates that no visible emissions are occuring in conjunction with the alarm and that no corrective actions are necessary to the baghouse equipment, no alarm time will be counted. If cumulative alarm time exceeds five percent of the total operating hours based on any continuous six-month rolling period, the operator shall shut down the equipment that vents into the baghouse until necessary actions are taken to eliminate the elevated emissions.

(4) Notwithstanding the provisions of paragraph (e)(1) and subparagraph (e)(3)(A) applicable to Tier 3 units, the operator of hot mix asphalt production equipment may conduct daily visible emissions monitoring, as described in paragraph (e)(1), in lieu of BLDS installation, provided the facility operator notifies the Executive Officer in writing no later than

May 1, 2010, files a permit application for a BLDS no later than June 1, 2011, and installs the BLDS within three months of issuance of the permit, at which time the operator shall comply with the provisions of paragraph (e)(3). Daily visible emissions monitoring shall begin no later than January 1, 2011 and continue until such time the BLDS is installed. The operator shall maintain records for each observation and any subsequent actions taken to eliminate visible emissions during the time in which daily visible emissions monitoring is conducted.

(5) No later than January 1, 2015 or after the end of the useful life of a COMS, whichever occurs sooner, a COMS installed at an existing Tier 3 baghouse shall be changed to a BLDS.

(6) Source tests conducted to demonstrate compliance with paragraph (d)(2) shall follow SCAQMD Methods 5.1, 5.2, or 5.3, as applicable.

(A) For a baghouse located at a Title V facility, the facility operator shall conduct an initial source test no later than January 1, 2011 to demonstrate compliance with the requirements of paragraph (d)(2). Subsequent source tests shall be conducted every five years thereafter.

(B) Source tests shall be conducted by an approved lab from the SCAQMD Laboratory Approval Program. For the purpose of this rule, the total weight of PM in solid and liquid form should be considered when conducting source tests.

(f) Recordkeeping

Records shall be kept in a format approved by the Executive Officer to demonstrate compliance with the provisions of this rule, and all records and information recorded pursuant to this subdivision shall be maintained at the facility for a minimum of five years and shall be made available to the Executive Officer immediately upon request.

(1) For the purposes of paragraph (e)(1), records kept shall include, but not be limited to:

(A) Facility name;

(B) Observer's name and affiliation;

(C) Date and time of observation;

(D) Process unit(s) being observed;

(E) Observer's position relative to the source;

(F) Observation duration;

(G) Whether visible emissions occurred and cumulative amount of time visible emissions occurred; and

(H) If visible emissions were observed, what actions were taken to correct the problem causing them, including and up to date and time of equipment shutdown, if applicable.

(2) For the purposes of paragraph (e)(3), records kept shall include, but not be limited to:

(A) Facility name;

(B) Facility representative for maintaining the BLDS;

(C) Date and time of routine maintenance and inspections conducted on BLDS;

(D) The date and time of any alarm, including length of the alarm time, and cause of the alarm;

(E) The date and time corrective action is completed to eliminate the cause of the alarm;

(F) Whether visible emissions occurred; and

(G) Total operating hours of the baghouse.

(g) Exemptions

(1) With the exception of paragraph (d)(1), any baghouse for which the filter surface area is less than or equal to 100 square feet is exempt from the provisions of this rule.

(2) The operator of a PM air pollution control device venting a non-continuous process is exempt from the provisions of paragraph (e)(1), provided no visible emissions occur when the process activity takes place.

(3) Any equipment with an active permit to operate that is not in operation as of December 4, 2009 shall be exempt from the provisions of this rule until operations commence.

(4) Facility operations that are subject to District Rules 1105.1 – Reduction of PM_{10} and Ammonia Emissions from Fluid Catalytic Cracking Units, and 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities, are exempt from the provisions of this rule.

(5) The operator of a Tier 1 or Tier 2 baghouse that voluntarily installs, operates, calibrates and maintains a BLDS pursuant to paragraph (e)(3) shall be exempt from the visible emissions provisions of paragraph (e)(1).

(6) Bin vents are exempt from the provisions of paragraph (e)(1).

(7) The provisions of paragraphs (d)(1), (d)(2), (d)(6), and (e)(1), and subparagraphs (e)(3)(E) through (e)(3)(G) shall not apply during the one-half hour of start-up of the equipment or process venting to the PM air pollution control device, including start-up after a repair to fix an equipment breakdown or after a scheduled maintenance activity.

(8) For PM air pollution control devices connected in series, the provisions of paragraphs (d)(2), (d)(6), and (e)(1) shall only apply to the PM air pollution control device exhausting to the atmosphere. In the event a Tier 3 baghouse is not the last in the series to vent to the atmosphere, the provisions of paragraph (e)(3) shall not apply.

(9) Any paint spray booth or powder spray booth is exempt from the provisions of this rule.

(10) Air pollution control equipment exclusively venting organic gases from hot mix asphalt load-out operations and directly related equipment, including storage silos, conveyors, mills, and batching towers, are exempt from the provisions of this rule.

(11) With the exception of paragraph (d)(1), any portable dust collector, fume extractor, or negative air machine with a maximum rated capacity of less than or equal to 3,000 cfm is exempt from the provisions of this rule.

(12) With the exception of paragraph (d)(1), facility operations that are subject to District Rule 1469 - Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations are exempt from the provisions of this rule.

(13) With the exception of paragraph (d)(1), high efficiency particulate air (HEPA) equipment are exempt from the provisions of this rule.

Table 1
Summary of Requirements

Fabric Filtration PM Air Pollution Control Equipment (baghouses)*			Other Fabric and Non-Fabric Filtration PM Air Pollution Control Equipment (dust collectors, cyclones, ESPs, wet scrubbers)*
Tier 1	Tier 2	Tier 3	n/a
≤ 500 square feet	> 500 – 7,500 square feet	> 7,500 square feet	n/a
Once-a-week visible emissions monitoring and recordkeeping (new, existing)	Once-a-week visible emissions monitoring and recordkeeping (new, existing)	Until BLDS is installed, once-a-week visible emissions monitoring and recordkeeping	Once-a-week visible emissions monitoring and recordkeeping (new, existing)
--	--	BLDS installation (new, existing)	--
--		Emission limit (0.01 gr/dscf)	--
		Title V facilities conduct initial source test and test every five years relative to compliance with the emission limit.	

* Except as provided in subdivision (g) Exemptions.